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### 1 [Routing: Routing performance in the presence of unidirectional links in multihop](#)


[wireless networks](#)

Mahesh K. Marina, Samir R. Das

 June 2002 **Proceedings of the 3rd ACM international symposium on Mobile ad hoc networking & computing**

Publisher: ACM Press

 Full text available: [pdf\(217.06 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We examine two aspects concerning the influence of unidirectional links on routing performance in multihop wireless networks. In the first part of the paper we evaluate the benefit from utilizing unidirectional links for routing as opposed to using only bidirectional links. Our evaluations are based on three transmit power assignment models that reflect some realistic network scenarios with unidirectional links. Our results indicate that the marginal benefit of using a high-overhead routing prot ...

**Keywords:** ad hoc networks, asymmetric links, multihop wireless networks, multipath routing, on-demand routing, routing, unidirectional links

### 2 [Distributed systems - programming and management: On remote procedure call](#)



Patrcia Gomes Soares

 November 1992 **Proceedings of the 1992 conference of the Centre for Advanced Studies on Collaborative research - Volume 2**

Publisher: IBM Press

 Full text available: [pdf\(4.52 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

The Remote Procedure Call (RPC) paradigm is reviewed. The concept is described, along with the backbone structure of the mechanisms that support it. An overview of works in supporting these mechanisms is discussed. Extensions to the paradigm that have been proposed to enlarge its suitability, are studied. The main contributions of this paper are a standard view and classification of RPC mechanisms according to different perspectives, and a snapshot of the paradigm in use today and of goals for t ...

### 3 [Probing the black box: User-level internet path diagnosis](#)



Ratul Mahajan, Neil Spring, David Wetherall, Thomas Anderson

 October 2003 **Proceedings of the nineteenth ACM symposium on Operating systems principles**

Publisher: ACM Press

 Full text available: [pdf\(403.57 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Diagnosing faults in the Internet is arduous and time-consuming, in part because the network is composed of diverse components spread across many administrative domains. We consider an extreme form of this problem: can end users, with no special privileges, identify and pinpoint faults inside the network that degrade the performance of their applications? To answer this question, we present both an architecture for user-level Internet path diagnosis and a practical tool to diagnose paths in the ...

**Keywords:** measurement tools, path diagnosis

4 Papers: A RED discard strategy for ATM networks and its performance evaluation with TCP/IP traffic



Vincent Rosolen, Olivier Bonaventure, Guy Leduc

July 1999 **ACM SIGCOMM Computer Communication Review**, Volume 29 Issue 3

**Publisher:** ACM Press

Full text available:  [pdf\(1.51 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

In ATM UBR networks supporting TCP traffic, optimal efficiency can only be envisaged if switches adopt a discard mechanism that operates at the packet level rather than the cell level. In this paper, we define a variant of the RED discard strategy suitable for ATM switches. An interesting feature of this ATM-RED is that it has a similar per-VC implementation complexity as the Early Packet Discard (EPD) algorithm. To study the efficiency of the ATM-RED discard strategy, we compare its performance ...


5 Transport 2: TCP with adaptive pacing for multihop wireless networks



Sherif M. ElRakabawy, Alexander Klemm, Christoph Lindemann

May 2005 **Proceedings of the 6th ACM international symposium on Mobile ad hoc networking and computing MobiHoc '05**

**Publisher:** ACM Press

Full text available:  [pdf\(508.33 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we introduce a novel congestion control algorithm for TCP over multihop IEEE 802.11 wireless networks implementing rate-based scheduling of transmissions within the TCP congestion window. We show how a TCP sender can adapt its transmission rate close to the optimum using an estimate of the current 4-hop propagation delay and the coefficient of variation of recently measured round-trip times. The novel TCP variant is denoted as TCP with Adaptive Pacing (TCP-AP). Opposed to previous ...

**Keywords:** IEEE 802.11 wireless networks, analysis and design of transport protocols, end-to-end congestion control, performance evaluation


6 Routing optimizations: A high-throughput path metric for multi-hop wireless routing



Douglas S. J. De Couto, Daniel Aguayo, John Bicket, Robert Morris


September 2003 **Proceedings of the 9th annual international conference on Mobile computing and networking**

**Publisher:** ACM Press

Full text available:  [pdf\(265.80 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents the *expected transmission count* metric (ETX), which finds high-throughput paths on multi-hop wireless networks. ETX minimizes the expected total number of packet transmissions (including retransmissions) required to successfully deliver a packet to the ultimate destination. The ETX metric incorporates the effects of link loss ratios, asymmetry in the loss ratios between the two directions of each link, and interference among the successive links of a path. In contrast, ...

**Keywords:** 802.11b, DSDV, DSR, ETX, ad hoc networks, multi-hop wireless networks, rooftop networks, route metrics, wireless routing

**7** Parallel shared-memory simulator performance for large ATM networks 


 Brian Unger, Zhongge Xiao, John Cleary, Jya-Jang Tsai, Carey Williamson  
October 2000 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**,  
Volume 10 Issue 4

**Publisher:** ACM Press

Full text available:  [pdf\(223.11 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


A performance comparison between an optimistic and a conservative parallel simulation kernel is presented. Performance of the parallel kernels is also compared to a central-event-list sequential kernel. A spectrum of ATM network and traffic scenarios representative of those used by ATM networking researchers are used for the comparison. Experiments are conducted with a cell-level ATM network simulator and an 18-processor SGI PowerChallenge shared-memory multiprocessor. The result ...

**Keywords:** ATM network modeling, conservative synchronization, optimistic synchronization, parallel discrete event simulation, time warp

**8** The transport layer: tutorial and survey 


 Sami Iren, Paul D. Amer, Phillip T. Conrad  
December 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 4

**Publisher:** ACM Press

Full text available:  [pdf\(261.78 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Transport layer protocols provide for end-to-end communication between two or more hosts. This paper presents a tutorial on transport layer concepts and terminology, and a survey of transport layer services and protocols. The transport layer protocol TCP is used as a reference point, and compared and contrasted with nineteen other protocols designed over the past two decades. The service and protocol features of twelve of the most important protocols are summarized in both text and tables. < ...

**Keywords:** TCP/IP networks, congestion control, flow control, transport protocol, transport service

**9** 802.11 protocols and usage: Design and evaluation of a new MAC protocol for long-distance 802.11 mesh networks 

 Bhaskaran Raman, Kameswari Chebrolu  
August 2005 **Proceedings of the 11th annual international conference on Mobile computing and networking MobiCom '05**

**Publisher:** ACM Press

Full text available:  [pdf\(631.02 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

802.11 has been used well beyond its original intended use of WLANs. Of particular interest to us in this paper is its use in long-distance mesh networks being designed/used for low-cost rural connectivity. We describe in detail a new MAC protocol, called 2P, that is suited for such networks in terms of efficiency. A significant challenge here is the implementation of this protocol on top of off-the-shelf 802.11 hardware, to preserve the cost benefits. We show how this can be achieved, by exploit ...


**Keywords:** 802.11 mesh networks, MAC design, network topology design, signal-to-interference ratio

**10** Advocating a remote socket architecture for internet access using wireless LANs 

M. Schläger, B. Rathke, A. Wolisz, S. Bodenstein  
January 2001 **Mobile Networks and Applications**, Volume 6 Issue 1

**Publisher:** Kluwer Academic Publishers

Full text available: Additional Information:

 [pdf\(490.10 KB\)](#)[full citation](#), [references](#), [index terms](#), [review](#)

**Keywords:** TCP, internet access, measurement, performance, socket-interface, wireless LAN



### 11 [TCP/IP performance with random loss and bidirectional congestion](#)

T. V. Lakshman, Upamanyu Madhow, Bernhard Suter

October 2000 **IEEE/ACM Transactions on Networking (TON)**, Volume 8 Issue 5**Publisher:** IEEE PressFull text available:  [pdf\(287.04 KB\)](#)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

**Keywords:** ADSL, TCP, buffer management, cable modems, scheduling

### 12 [Achieving MAC layer fairness in wireless packet networks](#)

 Thyagarajan Nandagopal, Tae-Eun Kim, Xia Gao, Vaduvur BharghavanAugust 2000 **Proceedings of the 6th annual international conference on Mobile computing and networking****Publisher:** ACM PressFull text available:  [pdf\(1.36 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Link-layer fairness models that have been proposed for wireline and packet cellular networks cannot be generalized for shared channel wireless networks because of the unique characteristics of the wireless channel, such as location-dependent contention, inherent conflict between optimizing channel utilization and achieving fairness, and the absence of any centralized control. In this paper, we propose a general analytical framework that captures the unique characteristics ...

### 13 [Mobile networking in the Internet](#)


Charles E. Perkins

December 1998 **Mobile Networks and Applications**, Volume 3 Issue 4**Publisher:** Kluwer Academic PublishersFull text available:  [pdf\(166.90 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Computers capable of attaching to the Internet from many places are likely to grow in popularity until they dominate the population of the Internet. Consequently, protocol research has shifted into high gear to develop appropriate network protocols for supporting mobility. This introductory article attempts to outline some of the many promising and interesting research directions. The papers in this special issue indicate the diversity of viewpoints within the research community, and it is ...

### 14 [Transport Protocol Optimization for Energy Efficient Wireless Embedded Systems](#)

Davide Bertozzi, Anand Raghunathan, Luca Benini, Srivaths Ravi

March 2003 **Proceedings of the conference on Design, Automation and Test in Europe - Volume 1 DATE '03****Publisher:** IEEE Computer SocietyFull text available:  [pdf\(162.21 KB\)](#)Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#) [Publisher Site](#)

For wireless embedded systems, the power consumption in the network interface (radio) plays a dominant role in determining battery life. In this paper, we explore transport protocol optimizations for reducing the energy consumption of wireless LAN interfaces. Our work is based on the observation that, the transport protocol, which implements flow

control to regulate the network traffic, plays a significant role in determining the workload of the network interface. Hence, by monitoring run-time p ...

15 Oral presentation session 1: Experiences of using wearable computers for ambient telepresence and remote interaction



Mikael Drugge, Marcus Nilsson, Roland Parviainen, Peter Parnes

October 2004 **Proceedings of the 2004 ACM SIGMM workshop on Effective telepresence**

**Publisher:** ACM Press

Full text available: [pdf\(1.11 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present our experiences of using wearable computers for providing an ambient form of telepresence to members of an e-meeting. Using a continuously running e-meeting session as a testbed for formal and informal studies and observations, this form of telepresence can be investigated from the perspective of remote and local participants alike. Based on actual experiences in real-life scenarios, we point out the key issues that prohibit the remote interaction from being entirely seamless, and ...

**Keywords:** ambient telepresence, mobile e-meetings, remote interaction

16 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

**Publisher:** IBM Press

Full text available: [pdf\(4.21 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

17 Principled design of the modern Web architecture



Roy T. Fielding, Richard N. Taylor

May 2002 **ACM Transactions on Internet Technology (TOIT)**, Volume 2 Issue 2

**Publisher:** ACM Press

Full text available: [pdf\(335.47 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The World Wide Web has succeeded in large part because its software architecture has been designed to meet the needs of an Internet-scale distributed hypermedia application. The modern Web architecture emphasizes scalability of component interactions, generality of interfaces, independent deployment of components, and intermediary components to reduce interaction latency, enforce security, and encapsulate legacy systems. In this article we introduce the Representational State Transfer (REST) arc ...

**Keywords:** Network-based applications, REST, World Wide Web

18 Workload analysis: Accurate, scalable in-network identification of p2p traffic using application signatures



Subhabrata Sen, Oliver Spatscheck, Dongmei Wang

May 2004 **Proceedings of the 13th international conference on World Wide Web**

**Publisher:** ACM Press

Full text available: [pdf\(205.76 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The ability to accurately identify the network traffic associated with different P2P

applications is important to a broad range of network operations including application-specific traffic engineering, capacity planning, provisioning, service differentiation, etc. However, traditional traffic to higher-level application mapping techniques such as default server TCP or UDP network-port based disambiguation is highly inaccurate for some P2P applications. In this paper, we provide an efficient approach ...

**Keywords:** application-level signatures, online application classification, p2p, traffic analysis


19 Role-based access control in telecommunication service management—dynamic role creation and management in TINA service environment



Takeo Hamada

October 1998 **Proceedings of the third ACM workshop on Role-based access control**

**Publisher:** ACM Press

Full text available:  [pdf\(975.87 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** TINA, role algebra, role class hierarchy, role mapping, role-based access control, security space, strongly-rolled system, telecommunication service management

20 TCP/IP data transfer over the DECT air interface with multibearer capability and support of asymmetric flows

Andrea Baiocchi

January 2001 **Wireless Networks**, Volume 7 Issue 1

**Publisher:** Kluwer Academic Publishers

Full text available:  [pdf\(231.89 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** DECT, MAC asymmetric connections, TCP over radio, protocol performance evaluation

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